Summary of GlueX Detector Subsystems

Prepared for the GlueX Electronics Review

July 24, 2003

Detector type	**Photon tagger**	**Vertex tracker**	**Straw tubes**	**Forward Drifts**	**Cerenkov**	**TOF**	**Barrel calorimeter**	**Forward calorimeter**	**Backward veto**
Signal Source	PMT	VLPC	Straw tube	anode (A) cathode (C)	PMT	PMT	PMT (P) ? HPD (H) ? MCP (M) ?	PMT	PMT
Channel count	250	2000	3400	2900 (A) 5800 (C)	40	320	600	2500	20
FADC	yes	no	yes (log)	no (A) yes (C)	yes	yes	yes	yes	yes
TDC	yes	yes	no	yes (A) no (C)	yes	yes	yes	no	yes
Typical charge	~ 1 nC	~ 1 pC	~ 40 fC	~ 20 fC (A) ~ 4 fC (C)	~ 10 pC	~ 1 nC	~ 1 nC (P) ~1 pC (H) ~1 nC (M)	~ 1 nC	~ 1 nC
Energy resolution	Given by segment	N/A	20%	N/A (A) 20% (C)	N/A but 10 p.e.	N/A	5%/√E	5%/√E	5%/√E
Time resolution	~ 100 ps	~ 1 ns	~ 1 ns	~ 1 ns	~ few ns	~ 80 ps	~ 200 ps with averaging	~ 1 ns	~ 1 ns
Dynamic range factor	5	5	50	200	10	10	1000	1000	100
Packaging constraints & issues	none	cryogenics	Preamps at upstream end and cabling inside BCAL	Preamps within barrel and B-field and cabling	Shielding of PMT's	Shielding of PMT's	Operation in B-field and choice of PMT,HPD or MCP	none	none
Known solutions for electronics	Used by CLAS	D0 at FNAL & look at VLPC alternatives	Look at existing straw tube solutions	standard	LASS CLAS	Prototypes tested at IHEP	KLOE	This detector used in BNL E852	standard
Institutional responsible	Glasgow Catholic U U Conn	FIU ODU	CMU	Ohio JLab	IHEP	IU IHEP	Regina	IU	FSU